

**Raw Recommended Prescriptions and Conservation Measures Received from Species Specialists
at and Subsequent to Workshops for "R" and "r" Goal Wildlife Species**

Evaluation Species	Prescription	Conservation Measures
Wildlife		
Salt marsh species (Carquinez Straits to Pittsburg)	<ol style="list-style-type: none"> 1. Reduce the risk of current and immanent threats to species at specific locations where species occur. 2. Restore and enhance areas to benefit several species. 3. Restore and enhance areas that provide the greatest results for the lowest cost. 4. Restore areas where there is an immediate opportunity for restoration. 5. Ensure suitable habitat is restored with populations of species established before diked wetland populations are reduced. 6. Restore and enhance areas for salt marsh species in order of priorities: 1) western Suisun marsh; 2) Gallinas/Ignacio marshes; 2) Napa Marshes; 3) Sonoma Marshes; 3) Petaluma Marshes; 3) Highway 37 marshes west of Sonoma creek; 4) Point Pinole; 5) Highway 37 marshes east of Sonoma Creek; 6) Eontra Costa Shoreline. 7. Design restoration dikes to maximize transition habitat area 	<ol style="list-style-type: none"> 1. Expand existing salt marsh around existing populations of salt marsh harvest mouse and bird's's beak. 2. Improve tidal circulation to diked wetlands that sustain some existing exchange. 3. Develop habitat connections among existing and restored tidal marshes. 4. Control and reduce population of non-native marsh species 5. Control non-native predators in existing and restored marshes 6. Develop and enhance low-angle upland slopes at marsh edge 7. Reintroduce bird's beak to existing and restored suitable marshes. 8. Research methods and feasibility for vegetation control and species reintroduction 9. Survey wetlands to document distribution and abundance of plants (initially and then annually)

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Salt Marsh Species (Eastern Suisun Marsh)	see above	<ol style="list-style-type: none"> 1. Restore large blocks of tidal marsh with a focus on Honker Bay and lower mouth of Sacramento River (null zone). 2. Expand existing salt marsh around existing populations of salt marsh harvest mouse and bird's's beak at outboard marshes only. 3. Research methods and feasibility for vegetation control and species reintroduction [Pete, help here with interp of your #9]. 4. Minimize artificial stabilization of salinity ranges. 5. Acquire and protect marsh transition zones with a focus on the Denverton area (also include uplands). 6. Montezuma Slough and Nurse Slough are priority of restoration. 7. Reintroduce bird's beak to existing and restored suitable marshes. 8. Adjust grazing regimes to improve transition habitat areas
Salt Marsh Species (Western Suisun Marsh - includes Grizzly and Suisun Bay)	see above	<ol style="list-style-type: none"> 1. Restore tidal actions to diked baylands around Potrero Hills with goal of developing transition habitats and restored tidal marsh. 2. Hill Slough, Potrero Hills, Moro Island, Connection for clapper rails? 3. Reintroduce bird's beak, Suisun thistle, and associated rare plants to existing and restored suitable marshes. 4. Research the ecological requirements of small mammals that use high marshes, 5. Interim management of diked wetlands to maintain source populations. 6. Consider restoration in Goodyear Slough and resolve railroad issues. 7. Interim conversion and management of ponds to partially micro-tidal lagoons.
Salt Marsh Species (Point Pinole)	see above	<ol style="list-style-type: none"> 1. Acquire and restore west side of Point Pinole to tidal marsh with upland edge and transition zone for San Pablo vole 2. Reintroduce Suada californica on north side of Point Pinole. 3. Control non-native Lepidium and other non-native invasives in existing and restored marsh

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Salt Marsh Species (Napa Marshes)	see above	<ol style="list-style-type: none"> 1. Restore tidal marsh, including alluvial upland edge in the American Canyon area. 2. Restore salt pannes at the crystalizers to offset impacts from tidal marsh conversion on shorebirds and other species 3. Convert all salt ponds along Napa River to tidal influence 4. Restore most of Skagg's Island to tidal marsh and upland transition 5. Restore diked wetlands around Fagen Slough to tidal wetlands 6. Restore transition/high marsh edge north of Biteon? Ponds off of Milton Rd. 7. Control and reduce population of non-native marsh species. 8. Control non-native predators in existing and restored marshes
Salt Marsh Species (Highway 37 marshes south of hwy)		<ol style="list-style-type: none"> 1. Restore Tubb's Island to tidal action 2. Restore tidal marsh around Sear's Point. 3. Remove berm at salt pond in-take channel on Highway 37 to restore drainage to marshes. 4. Control and reduce population of non-native marsh species. 5. Control non-native predators in existing and restored marshes
Salt Marsh Species (Gallinas/Ignacio Marshes)	see above	<ol style="list-style-type: none"> 1. Restore large tracts of tidal marsh (1600-2500 ac. Units) adjacent to proposed Hamilton AAFB restoration. 2. Reintroduce Pt. Reyes birds' beak and Johnny nip. 3. Control and reduce population of non-native marsh species. 4. Control non-native predators in existing and restored marshes
Salt Marsh Species (Sonoma Marshes)		<ol style="list-style-type: none"> 1. Restore baylands close to mouth of Sonoma Creek at least to second Napa Slough/ 2. Reintroduce Cortylanthus and associated rare plant species to enhanced and restored marshes
Salt Marsh Species (Petaluma Marshes)		<ol style="list-style-type: none"> 1. Restore baylands to tidal marsh along east side of lower Petaluma River south of Hog Island. 2. Control red foxes 3. Enhance transition/uplands on Niell's Island 4. Establish a wider tidal marsh corridor along lower west Petaluma River.

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<p>Salt Marsh Species (comments from F. Botti). Fred also commented on the importance of upland transition and size of salt marshes, but they are not included here.</p>	<p>Prior to any restoration in the eastern Suisun marsh, (ie opening to full tidal action), the area shall be evaluated for suitable habitat for salt marsh harvest mice, listed plant species, other sensitive species that may occur there.</p> <p>Restoration sites with suitable habitat shall not be restored until the restoration of at least twice as much acreage of tidal/high marsh/upland transition habitat has begun in the western Suisun marsh. In addition, an equal acreage amount of habitat shall be maintained as managed marsh within the eastern Suisun marsh to provide for species impacted by full tidal restoration until the newly restored habitat in the western Suisun marsh has developed to a point where it can support the listed species impacted. (I know this is awkward but hopefully it gets the point across - reword as you see fit)</p>	
<p>Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i></p>	<p>1. Maintain and restore connectedness among habitat corridors along the Sacramento, San Joaquin, and major tributaries within the historic VELB range.</p>	<p>1. Research the appropriate degree of connectedness of habitat required by the VELB for dispersal. 2. Include restoration of suitable riparian edge habitat (i.e., elderberry savanna) in proposed ERP riparian habitat restoration. 3. Implement USFWS guidelines to compensate for unavoidable program impacts. 4. Give priority in the ERP to restoring suitable habitats near existing occupied habitat areas to encourage natural expansion of the species range. 5. Include buffer strips around restored/enhanced suitable habitat to reduce potential adverse effects associated with pesticide drift. 6. Design levee operations and management guidelines to protect suitable habitat within levee programmatic actions. 7. Design levees to encourage the establishment and long-term maintenance of suitable habitat.</p>
Fishes		

Evaluation Species	Prescription	Conservation Measures
Chinook Salmon (late fall run) <i>Oncorhynchus tshawytscha</i> (fr)	1. Use chinook salmon (winter run) Recovery Plan methodology to develop the prescription for the fall run. 2. State doubling goals (1988 baseline). 3. Anadromous Fish Restoration Plan (AFRP) 1967-1991 baseline 4. Naturally produced fish 5. Maintain replacement rates >1.0 over a ? year average for all cohorts. 6. Delta Fish Recovery Plan has a prescription	1. DEFT + AFRP + CVPIA + CVAP 2. Adaptively manage use feedback loops; set time frames on measures + success criteria, feed info through CMARP. 3. Lots of existing plans for FR need to review + synthesize and look for gaps. 4. Physical barriers in the Delta must not interfere with recovery of the fall run and other fish. 5. Operate hatchery programs such that natural populations are not put at risk. 6. Need to understand distance of spawners and populations throughout Central Valley. 7. Develop methodology for adult enumeration. 8. Operate Red Bluff Diversion Dam to improve passage, reduce juvenile predation, and increase survival 9. Use mainstem actions in winter run recovery plan and apply to late fall run 10. Delta concerns for late fall run are similar to winter run and spring run
Chinook Salmon (San Joaquin fall run) <i>Oncorhynchus tshawytscha</i> (fr)	1. Use chinook salmon (winter run) Recovery Plan methodology to develop the prescription for the fall run. 2. State doubling goals (1988 baseline). 3. Anadromous Fish Restoration Plan (AFRP) 1967-1991 baseline 4. Naturally produced fish 5. Maintain replacement rates >1.0 over a ? year average for all cohorts. 6. Delta Fish Recovery Plan has a prescription plus candidate Cons. Agreement for the San Joaquin River.	1. DEFT + AFRP + CVPIA + CVAP 2. Adaptively manage use feedback loops; set time frames on measures + success criteria, feed info through CMARP. 3. Lots of existing plans for FR need to review + synthesize and look for gaps. 4. Physical barriers in the Delta must not interfere with recovery of the fall run and other fish. 5. Operate hatchery programs such that natural populations are not put at risk. 6. Incorporate the monitoring measures in CMARP technical Appendix. 7. Improve survival rates in south Delta. 8. Improve out migrating salmon survival. 9. Manage San Joaquin River flow to improve adult up migration.

Evaluation Species	Prescription	Conservation Measures
Chinook Salmon (Sacramento River fall run) <i>Oncorhynchus tshawytscha</i> (fr)	<ol style="list-style-type: none"> 1. Use winter run Recovery Plan methodology to develop the fall run prescription. 2. State doubling goals (1988 baseline). 3. Anadromous Fish Restoration Plan (AFRP) 1967-1991 baseline 4. Naturally produced fish 5. Maintain replacement rates >1.0 over a ? year average for all cohorts. 	<ol style="list-style-type: none"> 1. DEFT + AFRP + CVPIA + CVAP 2. Adaptively manage use feedback loops; set time frames on measures + success criteria, feed info through CMARP. 3. Lots of existing plans for FR need to review + synthesize and look for gaps. 4. Physical barriers in the Delta must not interfere with recovery of the fall run and other fish. 5. Develop acceptable fish passage solution at red bluff Diversion Dam (Jim W. Pers. comm.) 6. Operate hatchery programs such that natural populations are not put at risk. 7. Incorporate the monitoring measures in CMARP technical Appendix.
Chinook Salmon (spring run) <i>Oncorhynchus tshawytscha</i> (sr)	<ol style="list-style-type: none"> 1. Update and expand Recovery Plan to all SR streams 2. Review and adopt Recovery Plan 3. DEFT 4. DFG candidate species report for SR 	<ol style="list-style-type: none"> 1. Use info from biological opinions, recovery plan measures, DEFT, CVPIA, CVAP, and AFRP 2. Adaptively manage use feedback loops; set time frames on measures + success criteria, feed info through CMARP. 3. Lots of existing plans for SR need to review + synthesize and look for gaps. 4. Physical barriers in the Delta must not interfere with recovery of the fall run and other fish. 5. Develop acceptable fish passage solution at red bluff Diversion Dam (Jim W. Pers. comm.)
Chinook Salmon (winter run) <i>Oncorhynchus tshawytscha</i> (wr)	<ol style="list-style-type: none"> 1. Review and adopt Recovery Plan 2. DEFT? 	<ol style="list-style-type: none"> 1. Use conservation measures in biological opinions, recovery plan, and DEFT. 2. Adaptively manage using feedback loops; set time frames on measures and success criteria; feed info through CMARP. 3. Lots of existing plans for WR; need to review and synthesize and look for gaps. 4. Physical barriers in the Delta must not interfere winter run. 5. Develop acceptable fish passage solution at red bluff Diversion Dam (Jim W. Pers. comm.)
Delta Smelt <i>Hypomesus transpacificus</i>	<ol style="list-style-type: none"> 1. Use prescription in Recovery Plan 	<ol style="list-style-type: none"> 1. Use conservation measures in: a) biological opinions; b) 404 NWP + GP biological opinions; c) CVPIA biological assessment; d) PL84-99 Corps flood relief biological opinion; and e) DEFT reports.

Evaluation Species	Prescription	Conservation Measures
Delta Smelt <i>Hypomesus transpacificus</i> Central Valley fall-run, spring-run and winter-run chinook salmon <i>Oncorhynchus tshawytscha</i> Sacramento Splittail <i>Pogonichthys</i> <i>macrolepidotus</i> Longfin Smelt <i>Spirinchus thaleichthys</i> (Warnette pers. Comm.)		<p>1. Modify Delta inflow patterns and export operations during the February through June period to more closely mimic hydraulic conditions that would have occurred under conditions in the mid-1960s.</p> <p>2. Modify Delta inflow patterns and export operations during the November through January period to maintain a positive QWEST value.</p> <p>3. Fifty percent of any new water yield resulting from modified operating criteria or methods for Delta export facilities, new surface or groundwater storage, or water conservation and water use efficiency measures will be provided to an Environmental Water Account to be used at the discretion of the fish and wildlife agencies.</p> <p>4. Funding at the rate of \$1 per acre-foot of any in-Delta diversions will be provided to the fish and wildlife agencies to fund efforts to protect and improve habitat for the above species.</p> <p>5. Any in-Delta barriers will be operated with criteria approved by the DFG. No Grant Line barrier will be constructed.</p>

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Delta Smelt, <i>Hypomesus transpacificus</i> , and Sacramento Splittail, <i>Pogonichthys macrolepidotus</i> (Vandenberg pers. Comm.)		<ol style="list-style-type: none"> 1. Retire agricultural land in the south Delta to minimize the need for Barrier installation. 2. Provide operational flexibility at the CVP/SWP to eliminate need for barrier installation in the south Delta. 3. Set back levees in the south Delta to increase shallow water habitat. 4. Expand IEP monitoring in the south Delta for delta smelt. 5. Provide realistic incentives to landowners to allow sampling of 100% of the water diverted through agricultural diversions throughout the Delta. 6. Provide realistic incentives to landowners for the consolidation and screening of diversions. 7. Research feasibility to buy-out south Delta ag. interests 8. Initiate implementation of the Service's "Rainbow Report" or similar documentation to provide increased water quality in the south Delta and eliminate the need for barrier installation. 9. Develop and implement a management plan to reduce total salt load to the San Joaquin Valley. 10. Initiate programs for desalinization to reduce Delta exports. 11. Avoid using hard structures (i.e., rip rap) for bank stabilization. 12. Develop and implement studies to determine if artificial substrates are used by delta smelt for spawning. 13. Increase public awareness of the importance of Delta native fishes and their habitat. 14. Increase public awareness of the destruction to native fish and its habitat caused by exotic species. 15. The above measures may be applied to the Sacramento splittail to aid in its recovery.
Continued...		<ol style="list-style-type: none"> 15. The above measures may be applied to the Sacramento splittail to aid in its recovery.

Evaluation Species	Prescription	Conservation Measures
Green Sturgeon <i>Acipenser medirostris</i> (see notes as potential change to "r")	1. Review and adopt Recovery Plan	1. Need more information on: a) habitat use; b) limiting factors; c) distribution; d) spawning habitat; and e) flow requirements. 2. Change operations at Red Bluff Diversion Dam to benefit green sturgeon 3. Develop a tagging program for green sturgeon because the white sturgeon program is not appropriate. 4. Provide higher (>25,000 cfs) Sacramento River flows during March through May (spawning season) in 2 out of 5 years. 5. Need in-Delta harvest assessment. 6. Ensure the return of fish caught in the Yolo Bypass to drain to the Sacramento River.
Hardhead <i>Mylopharodon conocephalus</i>		
Longfin Smelt <i>Spirinchus thaleichthys</i>	1. Review and adopt Recovery Plans prescriptions. 2. Assume a "floor" of abundance that is better than what occurred during the drought. 3. Clearly define the "error structure" around abundance estimates or trends	1. Study and understand why longfin smelt is closely tied to X2. 2. Coordinate conservation measures for longfin with delta smelt and Splittail. 3. Coordinate conservation measures with Wetland Goals Plan. 4. Increase tidal wetlands to enhance food web support. 5. Reduce January - April export to <50% inflow when outflow is <8000 cfs. 6. Improve food supply by mobilizing carbon in the Yolo Bypass by ensuring inundation at least every other year. 7. Reduce impact of diversions during peak spawning period (January - March). 8. Provide enhanced January - February flows in 2nd Plus later years of drought. 9. Provide Delta outflow of 15,000 cfs/month in January and February. 10. Provide Delta outflow of >10,000 cfs/month between December - March.

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Sacramento Splittail <i>Pogonichthys macrolepidotus</i>	1. Use new information to revise and update the Recovery Plan	1. Use Conservation Measures in: a) conference biological opinions; b) 404 NWP + GP biological opinions; c) CVPIA biological assessment; d) PL84-99 Corps flood relief biological opinion. 2. Incorporate new information into conservation measures 3. Ensure the flooding of the Yolo and Sutter bypass at least once every 5 years because of the importance of seasonal wetland (flood plain habitats) to splittail. 6. Get more drought year value out of seasonal wetlands for fish (i.e., use the bypasses?) 7. Minimize stranding of splittail in wetland restoration efforts by maintaining connectivity.
Steelhead (Central Valley) <i>Oncorhynchus mykiss</i>	1. Use prescriptions in DFG Steelhead Management Plan. 2. NMFS does not have a recovery plan, but a 4d rule is expected in ca. April; critical habitat proposed rule due ca. February. 3. Multi species Central Valley Recovery Plan (NMFS) to begin soon. 4. May be some conference B.O. (Karl pers. comm) 5. ERP goal to restore late 1960's populations levels (ca. 16,000 fish at Red Bluff Diversion Dam) is a good start, but need more information and more specifics on locations of populations and their habitat. 6. Much more information is needed to determine prescription and this will be determined by recovery planning effort. 7. Increase naturally spawning populations number and sizes sufficient to maintain populations resiliency and to allow metapopulation persistence. 8. Increase the number of naturally spawned fish > 1986?-1988 average of naturally spawned and hatchery fish`	1. Maintain abundance and distribution of existing stocks. 2. Improve access to upper cool-water streams through dam removal, workable ladders, and direct planting. 3. Maintain suitable low temperatures below dams to provide rearing habitat. 4. CMARP Appendix on steelhead, monitoring measures 5. Minimize flow fluctuation to reduce/avoid losses to stranding of juveniles

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Sacramento Perch <i>Archoplites interruptus</i>	1. Depends on outcome of feasibility study	1. Determine feasibility of reestablishing populations in isolated habitats (away from competing non-native fish - centrachids)